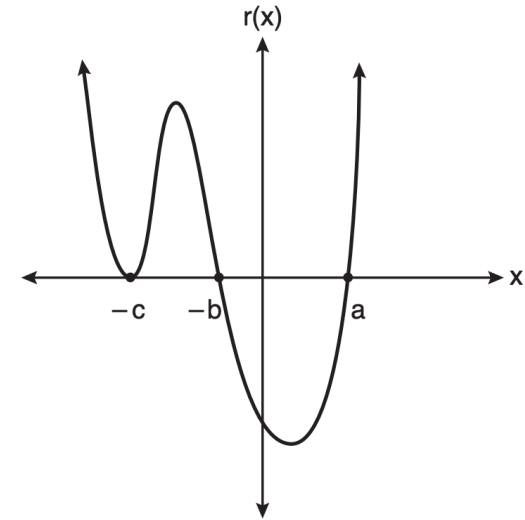


The Rickerts decided to set up an account for their daughter to pay for her college education. The day their daughter was born, they deposited \$1000 in an account that pays 1.8% compounded annually. Beginning with her first birthday, they deposit an additional \$750 into the account on each of her birthdays. Which expression correctly represents the amount of money in the account n years after their daughter was born?

- (1) $a_n = 1000(1.018)^n + 750$
- (2) $a_n = 1000(1.018)^n + 750n$
- (3) $a_0 = 1000$
 $a_n = a_{n-1}(1.018) + 750$
- (4) $a_0 = 1000$
 $a_n = a_{n-1}(1.018) + 750n$

A sketch of $r(x)$ is shown below.



An equation for $r(x)$ could be

- (1) $r(x) = (x - a)(x + b)(x + c)$
- (2) $r(x) = (x + a)(x - b)(x - c)^2$
- (3) $r(x) = (x + a)(x - b)(x - c)$
- (4) $r(x) = (x - a)(x + b)(x + c)^2$

Which binomial is *not* a factor of the expression $x^3 - 11x^2 + 16x + 84$?

(1) $x + 2$

(3) $x - 6$

(2) $x + 4$

(4) $x - 7$

The inverse of the function $f(x) = \frac{x+1}{x-2}$ is

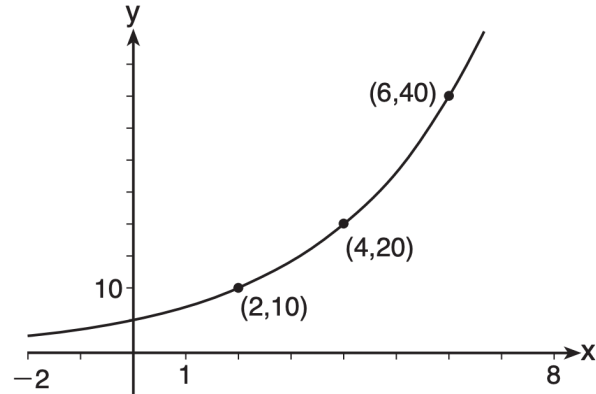
(1) $f^{-1}(x) = \frac{x+1}{x+2}$

(3) $f^{-1}(x) = \frac{x+1}{x-2}$

(2) $f^{-1}(x) = \frac{2x+1}{x-1}$

(4) $f^{-1}(x) = \frac{x-1}{x+1}$

The graph of $y = f(x)$ is shown below.



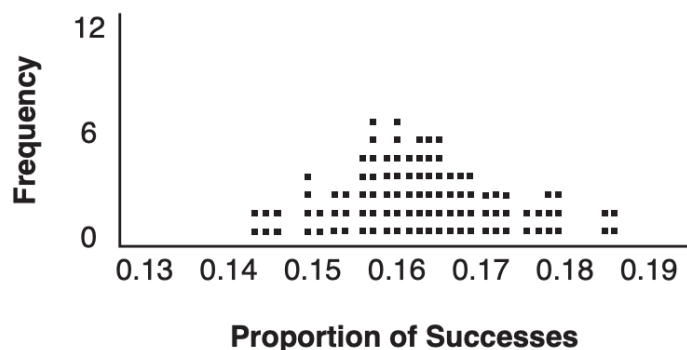
Which expression defines $f(x)$?

- | | |
|--------------|-------------------------------------|
| (1) $2x$ | (3) $5\left(2^{\frac{x}{2}}\right)$ |
| (2) $5(2^x)$ | (4) $5(2^{2x})$ |

On a given school day, the probability that Nick oversleeps is 48% and the probability he has a pop quiz is 25%. Assuming these two events are independent, what is the probability that Nick oversleeps and has a pop quiz on the same day?

- | | |
|---------|---------|
| (1) 73% | (3) 23% |
| (2) 36% | (4) 12% |

A study conducted in 2004 in New York City found that 212 out of 1334 participants had hypertension. Kim ran a simulation of 100 studies based on these data. The output of the simulation is shown in the diagram below.



At a 95% confidence level, the proportion of New York City residents with hypertension and the margin of error are closest to

- (1) proportion $\approx .16$; margin of error $\approx .01$
- (2) proportion $\approx .16$; margin of error $\approx .02$
- (3) proportion $\approx .01$; margin of error $\approx .16$
- (4) proportion $\approx .02$; margin of error $\approx .16$

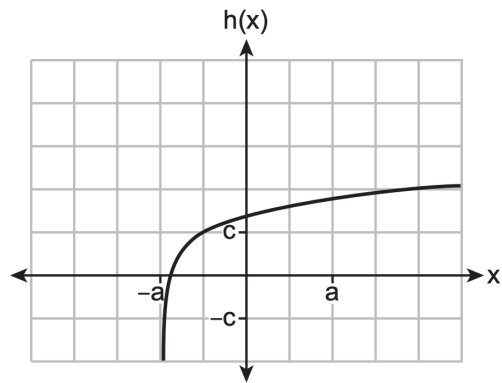
A savings account, S , has an initial value of \$50. The account grows at a 2% interest rate compounded n times per year, t , according to the function below.

$$S(t) = 50\left(1 + \frac{.02}{n}\right)^{nt}$$

Which statement about the account is correct?

- (1) As the value of n increases, the amount of interest per year decreases.
- (2) As the value of n increases, the value of the account approaches the function $S(t) = 50e^{0.02t}$.
- (3) As the value of n decreases to one, the amount of interest per year increases.
- (4) As the value of n decreases to one, the value of the account approaches the function $S(t) = 50(1 - 0.02)^t$.

Which equation best represents the graph below?



- (1) $h(x) = \log(x + a) + c$ (3) $h(x) = \log(x + a) - c$
 (2) $h(x) = \log(x - a) + c$ (4) $h(x) = \log(x - a) - c$

The solutions to the equation $5x^2 - 2x + 13 = 9$ are

- (1) $\frac{1}{5} \pm \frac{\sqrt{21}}{5}$ (3) $\frac{1}{5} \pm \frac{\sqrt{66}}{5}i$
 (2) $\frac{1}{5} \pm \frac{\sqrt{19}}{5}i$ (4) $\frac{1}{5} \pm \frac{\sqrt{66}}{5}$

The recursive formula to describe a sequence is shown below.

$$a_1 = 3$$

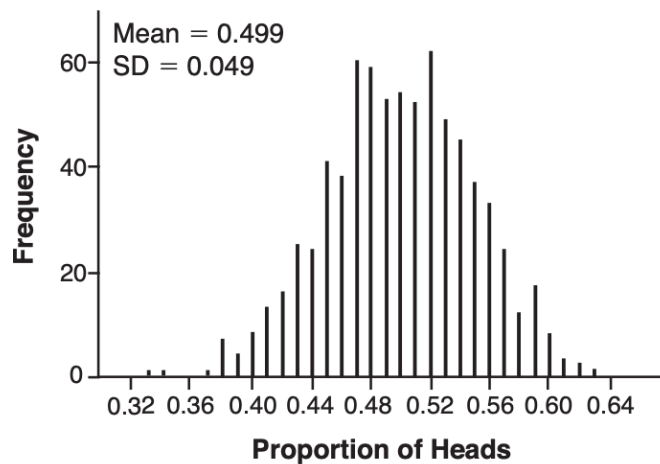
$$a_n = 1 + 2a_{n-1}$$

State the first four terms of this sequence.

Can this sequence be represented using an explicit geometric formula? Justify your answer.



Robin flips a coin 100 times. It lands heads up 43 times, and she wonders if the coin is unfair. She runs a computer simulation of 750 samples of 100 fair coin flips. The output of the proportion of heads is shown below.



Do the results of the simulation provide strong evidence that Robin's coin is unfair? Explain your answer.

Solve the equation $2x^2 + 5x + 8 = 0$. Express the answer in $a + bi$ form.